

Memorandum

To: Mr. John Moran, Teledyne Solutions, Inc.
From: Sean P. Thomas, ASCG Incorporated
CC: Mike McCrum, ASTS Incorporated
Date: 1/31/2006
Re: Landfill Capping Requirements as defined by the Alaska Department of Environmental Conservation

EXECUTIVE SUMMARY

This memorandum references the necessary regulatory requirements to indefinitely cap and close multiple former Landfill sites at Fort Greely, Alaska. Former BRAC Sites, 31, 32, all located near the western boundary of Fort Greely property are scheduled to be filled, capped and closed in support of future property developments at Fort Greely.

BRAC Sites 31 and 32, are former landfills that served the FGA Army Base during the mid-twentieth century. These landfills were decommissioned from usage in 1953. The exact dimensions, contents, construction and commissioning of each of these landfills are not known as noted in the *Environmental Sites Draft Decision Document* (Teledyne, 2004). It is believed however, that BRAC Sites 31 and 32 contained sanitary wastes and served primarily as municipal waste landfills.

Based on the lack of information detailing the exact nature, size and utilization of each of these locations, it is assumed that the landfills were each used as municipal waste landfills containing a conglomerate of wastes. Records of analytical testing are available for each location. Potential contaminants of concern, though present in some instances, levels are below ADEC clean-up levels in as noted in the *Environmental Sites Draft Decision Document* (Teledyne, 2004).

Given the estimated dimensions of roughly 2 to 4 acres for each individual location based on historical aerial photography referenced in-house; it is assumed that each of the individual BRAC locations in question can be defined as a Municipal Solid Waste Landfill (MSWLF) Type III.

Briefly, the final cover on a Class III MSWLF shall:

- Consist of soil or another material approved by the ADEC;
- Be capped by a final cover of at least 24 inches thick, or another thickness approved by the ADEC;
- be graded to promote drainage without erosion; and
- be revegetated or otherwise treated in a manner appropriate to the anticipated, future long-term use of the facility.

These regulations are further summarized below and excerpted detailed regulations are attached to this memorandum as well.

REGULATORY SUMMARY

Landfills in the State of Alaska are classified as Municipal Solid Waste Landfills (MSWLF) I, II, and III based upon daily volume of material being disposed of in the specific location. (18 AAC 60.300)

MSWLF I is defined as having over 20 Tons of material per day being disposed of in the landfill, based on an annual average. (18 AAC 60.300)

MSWLF II is defined as having less than 20 Tons but more than 5 Tons of material per day being disposed of in the landfill, based on an annual average. (18 AAC 60.300)

MSWLF III is defined as having less than 5 Tons of material per day being disposed of in the landfill, based on an annual average. (18 AAC 60.300)

Prior to beginning closure activities for landfill facilities within the State of Alaska written notification must be sent to the ADEC detailing intent to close the MSWLF.

Class I or Class II MSWLF facilities are to begin closure no later than 30 days after the date on which the MSWLF stops accepting waste or, if the MSWLF has remaining capacity and there is an investment-backed expectation that the MSWLF will receive additional waste, no later than one year after the most recent receipt of waste.

The ADEC will extend the one-year deadline for beginning closure if the owner or operator demonstrates that the MSWLF has the capacity to receive additional waste, and the owner or operator demonstrates a genuine intent to reopen the landfill and that, while temporarily closed, the owner or operator has taken and will continue to take all steps necessary to protect public health and the environment. (18.AAC.60.395f)

The owner or operator of a Class I or Class II MSWLF shall complete closure activities of the MSWLF in accordance with the closure plan and within 180 days after beginning closure. The department will extend the closure period if the owner or operator demonstrates that it is not economically or practically feasible to complete closure in 180 days and the owner or operator has taken and will continue to take all steps necessary to protect public health and the environment. (18.AAC.60.395g)

Capping requirements for landfills to be closed at locations within the State of Alaska are defined by regulations detailed in 18 AAC 60.

Class I or Class II MSWLF capping systems must be designed to minimize infiltration and erosion. The final cover system must be designed and constructed to prevent or drastically limit permeability of any leachate, surface runoff, etc. A minimum of 18 inches of earthen material to be used as an infiltration layer with a permeability no greater than 1×10^{-5} centimeters per second must be utilized in the capping effort. Finally, a minimum of 6 inches of earthen material must be utilized to prevent erosion and promote natural revegetation of the location. Specific definitions and regulations for the closure (physical capping) of a Class I or II MSWLF can be referenced in 18 AAC 60.395 (Attached).

The final cover on a Class III MSWLF must be soil or another material approved by the ADEC. The final cover must be at least 24 inches thick, or another thickness approved by the ADEC, must be graded to promote drainage without erosion, and must be revegetated or otherwise treated in a manner appropriate to the anticipated, future long-term use of the facility. Specific definitions and regulations for the closure (physical capping) of a Class I or II MSWLF can be referenced in 18 AAC 60.390 (Attached).

Subsequent to landfill closure procedures, the owner or operator is required to submit in writing to the ADEC a certification verifying completion of closure in accordance with the closure plan has been placed in the operating record. The certification must be signed and sealed by a registered engineer and must be approved by the ADEC.

After closure of a Class I or Class II MSWLF, the owner or operator shall record a notation on the deed to the landfill facility property, or some other instrument that is normally examined during a title search, and submit written notification to the ADEC and the landowner that the notation has been recorded and that a copy has been placed in the operating record. The notation on the deed must, in perpetuity, notify any potential purchaser of the property that the land was used as a MSWLF; and use of the land is restricted under [18 AAC 60.397](#)(c) (3).

What follows are excerpted regulations listed in various sections of 18 AAC 60.

EXCERPTED REGULATIONS

18 AAC 60.300. Definitions of a MSWLF

A Class I, Class II, and Class III MSWLF shall meet the specific requirements of [18 AAC 60.305](#) - [18 AAC 60.397](#). For purposes of this chapter, classifications are as follows:

- (1) a Class I MSWLF is a landfill that
 - (A) accepts, for incineration or disposal, 20 tons or more of municipal solid waste and other solid wastes daily, based on an annual average; or
 - (B) does not qualify as a Class II or Class III MSWLF;
- (2) a Class II MSWLF is a landfill that
 - (A) accepts, for incineration or disposal, less than 20 tons daily of municipal solid waste and other solid wastes based on an annual average;
 - (B) is located on a site where there is no evidence of groundwater pollution caused or contributed to by the landfill;
 - (C) is not connected by road to a Class I MSWLF or, if connected by road, is located more than 50 miles from a Class I MSWLF; and
 - (D) serves a community
 - (i) that experiences, for at least three months each year, an interruption in access to surface transportation, preventing access to a Class I MSWLF; or
 - (ii) with no practicable waste management alternative, with a landfill located in an area that annually receives 25 inches or less of precipitation; and
- (3) a Class III MSWLF is a landfill that is not connected by road to a Class I MSWLF or, if connected by road, is located more than 50 miles from a Class I MSWLF, and that accepts, for disposal,
 - (A) ash from incinerated municipal waste in quantities less than one ton daily on an annual average, which ash must be free of food scraps that might attract animals; or
 - (B) less than five tons daily of municipal solid waste, based on an annual average, and is not located in a place
 - (i) where public access is restricted, including restrictions on the right to move to the place and reside there; or
 - (ii) that is provided by an employer and that is populated totally by persons who are required to reside there as a condition of employment and who do not consider the place to be their permanent residence.

18 AAC 60.390. Closure Standards For a Class III MSWLF

(a) Closure of a Class III MSWLF must conform to the closure plan submitted under [18 AAC 60.210\(b\)\(3\)\(E\)](#). The final cover on a Class III MSWLF must be soil or another material approved by the department. The final cover must be at least 24 inches thick, or another thickness approved by the department, must be graded to promote drainage without erosion, and must be revegetated or otherwise treated in a manner appropriate to the anticipated, future long-term use of the facility.

(b) Within 90 days after closure of a Class III MSWLF, the owner or operator shall submit written notification to the department that closure has been completed as required by (a) of this section.

(c) The owner or operator shall establish permanent markers or survey monuments, if there are no readily observable, existing monuments or markers, from which the exact location of a facility and each closed portion of the facility can be determined.

18 AAC 60.395. Closure Standards For a Class I or Class II MSWLF

(a) Closure of a Class I or Class II MSWLF must conform to the closure plan prepared under (c) of this section and submitted under [18 AAC 60.210\(b\)\(3\)\(E\)](#). The owner or operator of a Class I or Class II MSWLF shall install a final cover system designed to minimize infiltration and erosion. The final cover system must be designed and constructed to

- (1)** have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils;
- (2)** minimize infiltration through the closed MSWLF by use of an infiltration layer that contains a minimum of 18 inches of earthen material with a permeability no greater than 1×10^{-5} centimeters per second; and
- (3)** minimize erosion of the final cover by use of an erosion layer that contains a minimum of six inches of earthen material capable of sustaining native plant growth.

(b) The department will approve an alternative final cover design if the applicant demonstrates that the proposed design will protect public health and the environment and that it includes an

- (1)** infiltration layer that achieves an equivalent reduction in infiltration as the infiltration layer specified in (a) of this section; and
- (2)** erosion layer that provides equivalent protection from wind and water erosion as the erosion layer specified in (a)(3) of this section.

(c) The owner or operator of a Class I or Class II MSWLF shall prepare a written closure plan that describes the steps necessary to close that person's MSWLF at any point during its active life in accordance with the cover design requirements of (a) or (b) of this section, as applicable. In addition to the information required by [18 AAC 60.210\(b\)\(3\)\(E\)](#), the closure plan must include

- (1)** a description of the final cover, designed in accordance with (a) or (b) of this section, as applicable, and the methods and procedures to be used to install the cover;
- (2)** an estimate of the largest area of the MSWLF ever likely to require a final cover;
- (3)** an estimate of the maximum inventory of wastes ever likely to be onsite over the active life of the facility; and
- (4)** a schedule for completing all activities necessary to satisfy the closure standards in this section.

(d) Repealed 9/7/2002.

(e) Before beginning closure of a Class I or Class II MSWLF as specified in (f) of this section, the owner or operator shall submit written notification to the department of the intent to close the MSWLF.

(f) Notwithstanding [18 AAC 60.245\(a\)](#) , the owner or operator shall begin closure activities of a Class I or Class II MSWLF no later than 30 days after the date on which the MSWLF stops accepting waste or, if the MSWLF has remaining capacity and there is an investment-backed expectation that the MSWLF will receive additional waste, no later than one year after the most recent receipt of waste. The department will extend the one-year deadline for beginning closure if the owner or operator demonstrates that the MSWLF has the capacity to receive additional waste, and the owner or operator demonstrates a genuine intent to reopen the landfill and that, while temporarily closed, the owner or operator has taken and will continue to take all steps necessary to protect public health and the environment.

(g) The owner or operator of a Class I or Class II MSWLF shall complete closure activities of the MSWLF in accordance with the closure plan and within 180 days after beginning closure. The department will extend the closure period if the owner or operator demonstrates that it is not economically or practically feasible to complete closure in 180 days and the owner or operator has taken and will continue to take all steps necessary to protect public health and the environment.

(h) After closure of a Class I or Class II MSWLF, the owner or operator shall submit written notification to the department that a certification verifying completion of closure in accordance with the closure plan has been placed in the operating record. The certification must be signed and sealed by a registered engineer or must be approved by the department.

(i) After closure of a Class I or Class II MSWLF, the owner or operator shall record a notation on the deed to the landfill facility property, or some other instrument that is normally examined during a title search, and submit written notification to the department and the landowner that the notation has been recorded and that a copy has been placed in the operating record. The notation on the deed must, in perpetuity, notify any potential purchaser of the property that

- (1) the land was used as a MSWLF; and
- (2) use of the land is restricted under [18 AAC 60.397\(c\)](#) (3).

Public Notice Documents for Landfill closures can be referenced at:

http://www.dec.state.ak.us/eh/docs/sw/Cleanup_closure.htm